

Organic Aerogels with Improved Resilience and Flexibility for Multifunctional Protection in Spacesuits, Phase I

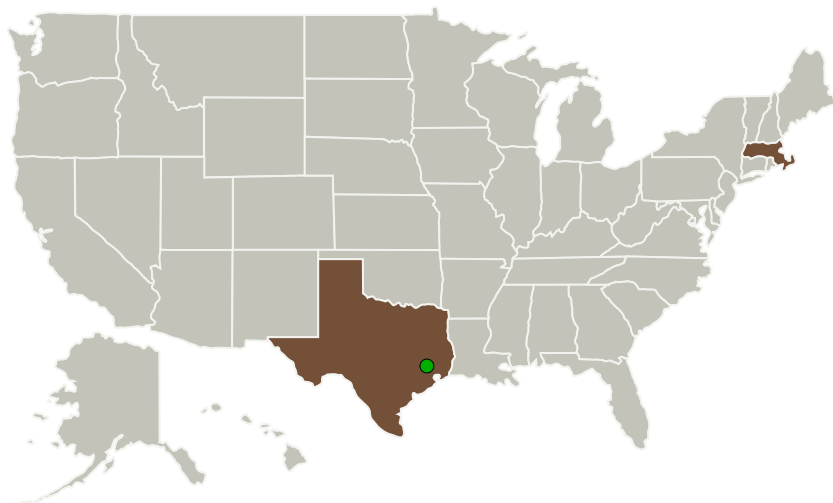
Completed Technology Project (2012 - 2012)



Project Introduction

Aspen Aerogels Inc. proposes to develop high resilience polymeric aerogel for use as a multifunctional spacesuit material which will significantly improve human comfort and maneuverability in advanced extravehicular activity (EVA). The proposed aerogel material will exhibit excellent elastic recovery, flexibility, durability, temperature sensitive water permeability, along with excellent thermal insulation properties at low weight and volume. The proposed developments will result in materials with excellent resilience and flexibility which can be used for advanced space suits or garments with increased comfort and maneuverability. The novel resilient aerogels will overcome the weak, brittle, dusty nature of conventional inorganic aerogels, and the high compression set and lack of durability of the organic aerogels previously developed. The aerogels will be multifunctional as they will provide superior thermal insulation and inherent radiation protection suitable for NASA EVA suits and exploration habitats. These aerogel materials are also applicable to NASA's space hardware and vehicles as well as many other aerospace, military, and commercial insulation applications.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Aspen Aerogels, Inc.	Lead Organization	Industry	Northborough, Massachusetts
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Massachusetts	Texas

Project Transitions

**February 2012:** Project Start**August 2012:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138397>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Aspen Aerogels, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

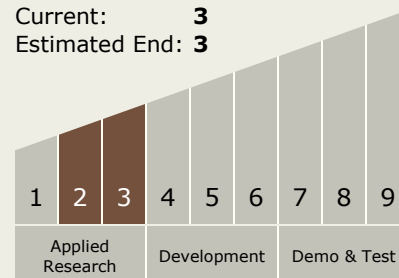
Roxana Trifu

Technology Maturity (TRL)

Start: 2

Current: 3

Estimated End: 3



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.2 Extravehicular Activity Systems
 - └ TX06.2.1 Pressure Garment

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System